Remarks

Claims 1-22 are pending in the application. Claims 1, 3, 5, 14-15 and 22 have now been amended. New claims 23-24 have been added. Claim 10 has been canceled. The fee in the amount of $50.00 under 37 C.F.R. §1.16(i) for one additional claim has been enclosed.

I. Correction of Informalities

Applicants have amended the specification to correct certain errors in paragraph 0012. Specifically, Applicants are amending Equations 2 and 3 of paragraph 0012 to correct typographical errors by including brackets where brackets surrounding the "T_i-T_o" portion of the equations were mistakenly left out.

Additionally, Applicants have amended claims 1, 5, 14, 15 and 22 to replace the expressions "hydrogen/hydrocarbon" and "H_2/HC" in the claims to read "hydrogen/(toluene + methanol)." The expression "hydrocarbon" or "HC" used throughout the application is meant to encompass the alkylation feed of the aromatic compound and alkylating agent used in the alkylation reaction, or in the case of toluene methylation, the feed of toluene and methanol. Applicants believe this provides a clearer reading and understanding of the claim language. Applicant submits that in no way is this amendment being made for the purposes of patentability.

II. Rejections Under 35 U.S.C. §103

The Examiner has rejected pending claims 1-22 as being obvious under §103, based upon the reference Brown et al. (U.S. Patent No. 6,504,072). Specifically, the

The Examiner states that the "difference between the instantly claimed process and that of Brown et al. is that the instant claims refer to a "start-up" phase and then a "run" phase. The Examiner argues that the "claimed process would have been obvious because these phases are not distinguishable from one another."

Applicants submit that the reference cited and relied on by the Examiner does not provide a *prima facie* case of obviousness of the presently pending claims. In order to establish a *prima facie* case of obviousness, the prior art references must teach or suggest

all of the claim limitations when combined. *See In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974); and MPEP 2143.03.

Referring to Examples 1-9, which the Examiner has noted, none of the examples show a run time of longer than 20 hours, with the exception of Example 3, which has a run time 20.6 hours. These are all generally within the time range specified in claim 1 for the time of operation for start-up conditions and thus do not meet the limitation that requires separate run conditions.

Further, Applicants have amended independent claims 1, 14 and 22 to further define that operating at run conditions includes reducing the LHSV by 5 hr^{-1} (claims 1 and 14) or 10 hr^{-1} (claim 22) or more. This is discussed in paragraph 0017, where it is described that the conditions are adjusted to "run conditions" that include "LHSV reduction" (p, 7, lines 15-17).

Moreover, the benefits of the claimed change from start-up conditions to run conditions are demonstrated in Example 1 of Applicants' specification. The LHSV of Example 1 is reduced from a start-up LHSV of 32 hr^{-1} to a run LHSV of 2 hr^{-1}. This results in high para-xylene selectivity of greater than 92% (see Example 1 of Figure 1) in combination with a high toluene conversion (see Example 1 of Figure 2) over significant lengths of time (i.e. 500 hours). This is in contrast to the much shorter run time periods of 20 hours or less that are disclosed in the Brown et al. reference.

Such benefits are particularly evident when compared to Examples 2-6 of Applicants' specification. As shown in Examples 2-6, where no change in LHSV is made from start-up to run conditions, toluene conversion levels drop off drastically over time. Further, for Example 2, the toluene conversion is still significantly lower, at less than 10%, than that of Example 1 at over 15% and employs a drop in LHSV. Even in Example 6, where the LHSV is eventually lowered during the run period, but where the LHSV is not within Applicants' claimed range for such run period, the para-xylene selectivity and toluene conversion over time drop off quickly.

Accordingly, all of Applicants' claims should be allowed for the above-discussed reasons.

With respect to amended claim 3, Applicants have specified that the start-up LHSV is from about 10 to 50 hr^{-1}. Applicants submit that this is on an order well above

that of the WHSV of 4 hr^{-1} disclosed in Brown et al. Accordingly, this claim should be allowed for this additional reason.

Independent claim 14 has been further amended to require that the hydrogen/hydrocarbon molar ratio is increased from startup conditions. This is discussed at paragraph 0017 of Applicants' specification, where it is described that the hydrogen cofeed is adjusted to a hydrocarbon/(toluene + methanol) molar ratio of at least 1 or more. Such increase in the hydrocarbon/(toluene + methanol) molar ratio is also disclosed in Applicants' Example 1, where the hydrocarbon/(toluene + methanol) molar ratio is adjusted from 0.1 during start-up conditions to 7 during run conditions. Such an increase in any hydrocarbon/(toluene + methanol) molar ratio is not shown, described or otherwise suggested in Brown et al. Accordingly, claim 14 and those depending from it should be allowed for this additional reason.

Independent claim 22 has also been amended to further specify that the H_2/HC molar ratio is increased by at least 2. Again, no such increase is shown, described or otherwise suggested in Brown et al.

Additionally, claim 22 has been amended to specify that the phosphorus-treated ZSM-5 zeolite catalyst that is "non-steamed." Support for this limitation is found in Applicants' specification, such as at paragraph 0014 and in the examples, where the catalyst preparation is described. It is evident from Applicants' disclosure that no such steaming is used or described in the preparation of Applicants' catalyst. In contrast, Brown et al. utilizes severe steaming of the catalyst at a temperature of at least 950°C (see column 4, lines 1-5). For this additional reason independent claim 22 should be allowed.

New claims 23 and 24, which are dependent on claims 1 and 14, respectively, each add the limitation that the hydrocarbon/(toluene + methanol) molar ratio is increased by at least 2 when switching from start-up to run conditions. As discussed earlier for claim 22, this is not shown, described or suggested by Brown et al. Accordingly, these claims should be allowed.

III. Conclusion

In view of all of the reasons presented above, Applicant submits that the application is in a condition for allowance. Favorable action is therefore respectfully requested.

This response is being submitted within three months from the date of the office action. If any extension of time is believed necessary, however, such extension is hereby by requested. If any fees are deemed necessary for the continued prosecution of the present application, the Commissioner is hereby authorized to charge them to Deposit Account No. 50-1899.

Please contact the undersigned at the address or telephone number listed below should there be any questions, or if contacting the undersigned would expedite or aid the examination or prosecution of this application.

Date: June 2, 2005

Respectfully submitted,

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